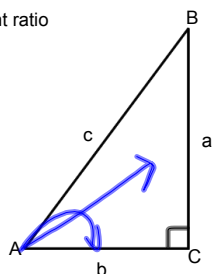


## 7-4 Trigonometry

The tangent ratio

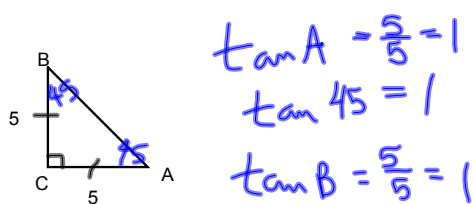
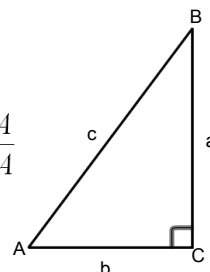
Side adjacent to  $\angle A$   $b$ Side opposite of  $\angle A$   $a$ 

The tangent ratio

$$\tan A = \frac{\text{side opposite } \angle A}{\text{side adjacent } \angle A}$$

$$\tan A = \frac{a}{b}$$

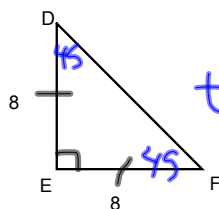
$$\tan B = \frac{b}{a}$$



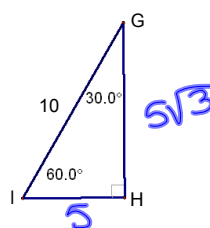
$$\tan A = \frac{5}{5} = 1$$

$$\tan 45 = 1$$

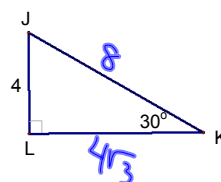
$$\tan B = \frac{5}{5} = 1$$



$$\tan F = \frac{8}{8} = 1$$

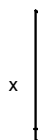


$$\tan 60 = \frac{5\sqrt{3}}{5} = \sqrt{3}$$



$$\tan 60 = \frac{4\sqrt{3}}{4} = \sqrt{3}$$

Every angle has a specific tangent value



$$\tan 35 = \frac{x}{20}$$

$$20 \tan 35 = x$$

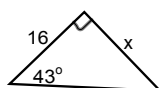
$$14.0 \approx x$$

$$\tan 55 = \frac{20}{x}$$

$$\frac{x \tan 55}{\tan 55} = \frac{20}{\tan 55}$$

$$x = \frac{20}{\tan 55}$$

$$x = 14.0$$



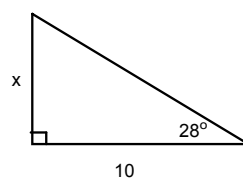
$$\tan 43 = \frac{x}{16}$$

$$16 \tan 43 = x$$

$$11.9 \approx x$$

Do:

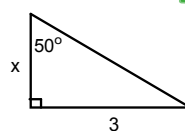
1.



$$\tan 28 = \frac{x}{10}$$

$$x \approx 5.3$$

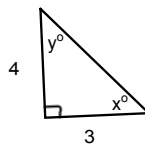
2.



$$\tan 50 = \frac{3}{x}$$

$$x \approx 2.5$$

You can also find the angle if you have the legs.

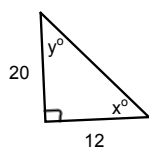


$$\tan x = \frac{4}{3}$$

$$\tan^{-1}\left(\frac{4}{3}\right) = x$$

$$53.1^\circ \approx x$$

$$\begin{aligned}\tan y &= \frac{3}{4} \\ \tan^{-1}\left(\frac{3}{4}\right) &= y \\ 36.9^\circ &\approx y\end{aligned}$$



$$\tan y = \frac{12}{20}$$

$$\tan^{-1}\left(\frac{12}{20}\right) = y$$

$$31.0^\circ \approx y$$

$$59.0^\circ \approx x$$